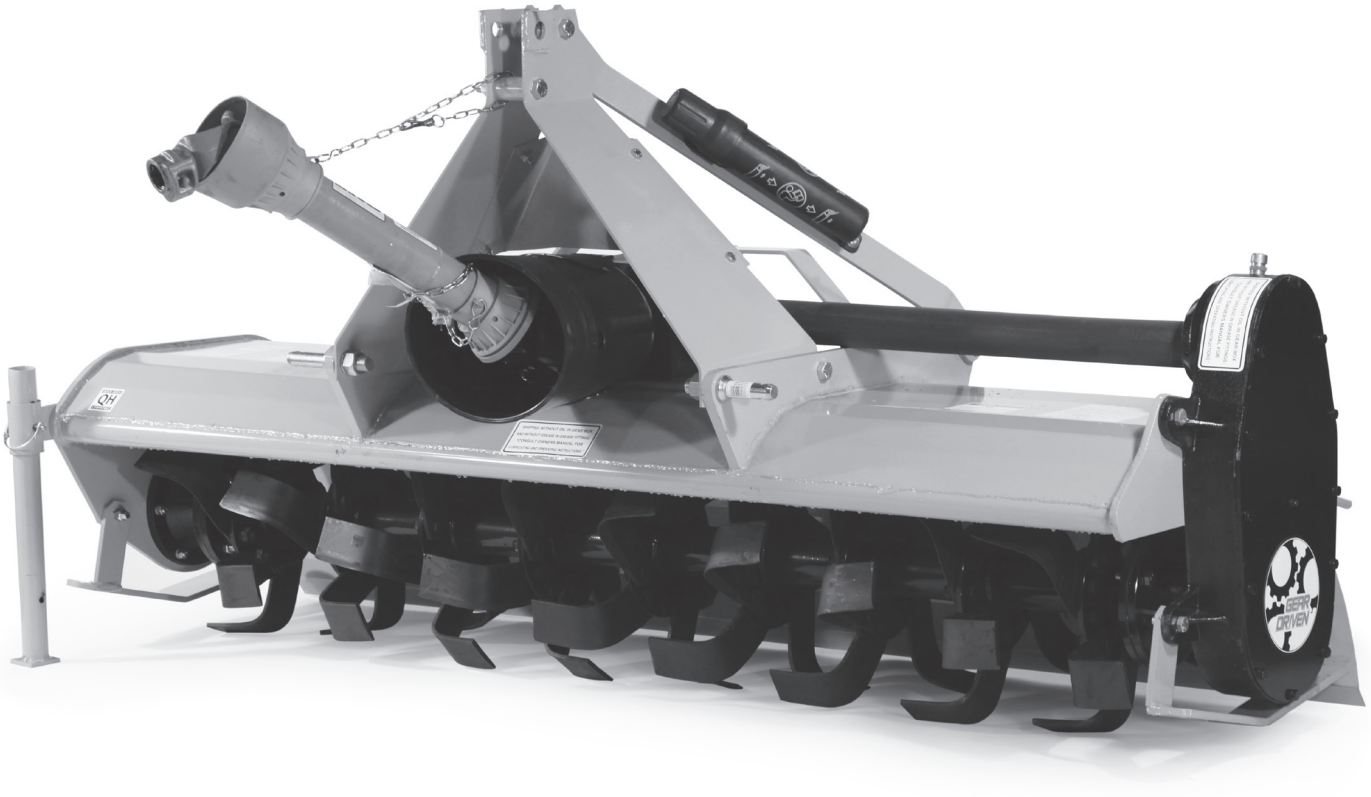

ROTARY TILLER

OPERATION AND ASSEMBLY MANUAL

INTRODUCTION

TO THE OWNER:

Read this manual before operating your equipment. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all adjustments and operating procedures before attempting to operate the equipment. Replacement manuals can be obtained from your selling dealer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Please observe all safety information in this manual and safety decals on the equipment.

Use only genuine service parts. Substitute parts will void the warranty and may not meet the required standards for safe and satisfactory operation.

Throughout this manual, the term IMPORTANT is used to indicate that failure to observe procedures can cause damage to equipment. The terms CAUTION, WARNING and DANGER are used in are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.

This Safety-Alert Symbol indicates a hazard and means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

DANGER — **Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.**

WARNING — **Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed.**

CAUTION — **Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.**

IMPORTANT — **Indicates that failure to observe can cause damage to equipment.**

NOTE — **Indicates helpful information.**

IT IS THE PURCHASER AND/OR OPERATOR'S RESPONSIBILITY TO….

Read and understand the information contained in this manual.

Operate, lubricate, assemble and maintain the equipment in accordance with all instructions and safety procedures in this manual.

Inspect the equipment and replace or repair any parts that are damaged or worn which under continued operation would cause damage, wear to other parts, or cause a safety hazard.

Return the equipment or parts to the authorized dealer, from where it was purchased, for service or replacement of defective parts that are covered by warranty. (Manufacturer may inspect equipment or parts before warranty claims are honored.)

Payment of all costs incurred by the dealer for traveling to or transporting the equipment for warranty inspection and or claims.

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All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

TO THE PURCHASER:

This manual contains valuable information about your new Rotary Tiller. It has been carefully prepared to give you helpful suggestions for operating, adjusting, servicing and ordering repair parts.

Keep this manual in a convenient place for quick and easy reference. Study it carefully. You have purchased a dependable and sturdy tiller, but only by proper care and operation can you expect to receive the service and long life designed and built into it.

Sometime in the future your tiller may need new parts to replace those that are worn or broken. If so, go to your dealer and provide him with the model and part number.

CUSTOMER INFORMATION

Name _____

Purchased From _____

Date Purchased _____

Model No. _____

Serial No. _____

TRAINING

Safety is a primary concern in the design and manufacturing of our product. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.

It has been said, " The best safety device is an informed, careful operator." We ask you to be that kind of operator. It is the operator's responsibility to read and understand all safety and operating instructions in the manual and to follow them. Accidents can be avoided.

Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your tractor, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than you, or is loaned or rented, it is the rotary tiller owner's responsibility to make certain that the owner's manual be available to the operator prior to operating:

1.) Reads and understands the operator's manuals.
2.) Is instructed in safe and proper use.

Know your controls and how to stop the tractor, engine, and tiller quickly in an emergency. Read this manual and the one provided with your tractor.

Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.

PREPARATION

Never operate the tractor and tiller until you have read and completely understand this manual, the Tractor Operator's Manual, and each of the safety messages found on the safety signs on the tractor and tiller.

Personal protection equipment including hardhat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintenance, repairing, removal, or moving the implement. Do not allow long hair, loose fitting clothing, or jewelry to be around equipment.

PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS! Tractors with or without tillers attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a fulltime basis if the noise in the operator's position exceeds 80 db. Noise over 80 db on a long-term basis can cause severe hearing loss. Noise over 90 db adjacent to the operator over a long-term basis may cause permanent, total hearing loss.

NOTE: Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.

Operate the tiller only with a tractor equipped with an approved Roll-Over-Protective System (ROPS). Always wear your seat belt. Serious injury or even death could result from falling off the tractor — particularly during a turnover when the operator could be pinned under the ROPS or the tractor.

Clear area to be tilled of stones, branches or other debris that might be thrown or entangled in the tiller, causing injury or damage.

Operate only in daylight or good artificial light.

Ensure tiller is properly mounted, adjusted and in good operating condition.

Ensure that all safety shielding and safety signs are properly installed and in good condition.

STARTING AND STOPPING

Check the tractor master shield over the PTO stub shaft. Make sure it is in good condition and fastened securely to the tractor. Purchase a new shield if old shield is damaged or missing.

All tractors that are not equipped with a "live" power takeoff (PTO) need to be equipped with an over-running PTO clutch. These are available through most farm equipment stores.

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NOTE: The addition of an over-running PTO clutch may change the length of the PTO driveline required. Pay extra attention to the instructions on the PTO Driveline Installation. Be sure that the driveline system guarding is adequate.

Tiller operating power is supplied from the tractor PTO. Refer to your tractor manual for PTO engagement and disengagement instructions. Know how to stop tractor and tiller quickly in case of an emergency.

When engaging PTO, the engine RPM should always be at idle speed. Once engaged and ready to start tilling, raise PTO speed to 540-RPM and maintain throughout tilling operation.

OPERATION

The use of this equipment is subject to certain hazards that cannot be protected against by the mechanical means or product design. All operators of this equipment must read and understand this entire manual, paying particular attention to safety and operating instructions, prior to using. If there is something in this manual you do not understand, ask your supervisor, or your dealer, to explain it to you.

Most accidents occur because of neglect or carelessness. Keep all helpers and bystanders at least several hundred feet from an operating rotary tiller. Only properly trained people should operate this machine.

When machine is operated in populated areas where thrown objects could injure persons or property, operation must be stopped when anyone comes within several hundred feet.

The majority of the accidents involve entanglement on the driveline, injury of bystanders by the objects thrown by the rotating tines, and operators being knocked off the tractor by low hanging limbs and then being run over by the tiller. Accidents are most likely to occur with machines that are loaned or rented to someone who has not read the owner's manual and is not familiar with a rotary tiller.

The rotary tiller is designed for use only on tractors with the power takeoff (PTO) turning at 540-RPM.

Install and secure all guards and shields before starting or operating. The tiller tines, driveline guards and tractor, shields should be used and maintained in good working condition. They should be inspected carefully, at least daily, for missing or broken chain links, shields, or guards. (Worn items must be replaced at once to reduce possibility of injury.)

Disengage power takeoff (PTO) and place transmission in neutral before attempting to start engine.

Many varied objects, such as wire, cable, rope, or chains, can become entangled in the operating parts of the tiller. These items could then swing outside the housing at greater velocities than the tines. Such a situation is extremely hazardous. Inspect the cutting area for such objects before tilling. Remove any like objects from the site.

Never allow the tilling tines to contact such items. Never assume an area is clear. Always Check!

Always stop the tractor, disengage PTO, set brake, shut off the tractor engine, remove the ignition key, lower implement to the ground and allow rotating pieces to come to a complete stop before dismounting tractor. Never leave equipment unattended with the tractor running.

Never place hands or feet under tiller with tractor engine running or before you are sure all motion has stopped. Stay clear of all moving parts.

Do not reach or place any part of your body under equipment until it is blocked securely.

Do not allow riders on the rotary tiller or tractor at anytime. There is no safe place for any riders.

Do not operate unless all personnel, livestock, and pets are several hundred feet away to prevent injury by thrown objects.

Never operate tractor and rotary tiller under trees with low hanging limbs. Operators can be knocked off the tractor and then run over by the rotating tines.

The rotating parts of this machine have been designed and tested for rugged use. However, they could fail upon impact with heavy, solid objects such as steel guardrails and concrete abutment. Such impact could cause the broken objects to be thrown outward at very high velocities. To reduce the possibility of property damage, serious injury, or even death, never allow the tilling tines to contact such obstacles.

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Stop rotary tiller and tractor immediately upon striking an obstruction. Turn engine off, remove key, inspect and repair any damage before resuming operation.

Stay alert for uneven terrain, holes, rocks, and roots and other hidden hazards. Keep away from drop-offs and hazards that could cause roll over. Use extreme care and maintain minimum ground speed when transporting or operating on hillsides, over rough ground and when operating close to ditches or fences. Be careful and slow down when turning sharp corners and changing direction on slopes. Do not start or stop suddenly on slopes. Avoid operation on steep slopes. In extremely uneven terrain, rear wheels weights, front tractor weight, and/or tire ballast should be used to improve stability.

Pass rotary tiller diagonally through sharp dips and avoid sharp drops to prevent "hanging up" tractor and rotary tiller. Practice will improve your skills in maneuvering on rough terrain. Always cut down slopes, never across the face. Always check tractor manual for proper use on slopes.

When using a unit, a minimum 20% of tractor and equipment weight must be on tractor front wheels. Without this weight, tractor could tip over, causing personal injury or death. The weight may be attained with a front end loader, front wheel weights, ballast in the tires or front tractor weights. When attaining a minimum 20% of tractor and equipment weight on the front wheels, you must not exceed the ROPS weight certification. Weigh the tractor and equipment. Do not guess or estimate!

TRANSPORTATION

Comply with state and local laws governing highway safety and movement of farm machinery on public roads.

The use of flashing amber lights is acceptable in most localities. However, some localities prohibit their use. Local laws should be checked for all lighting and marking requirements.

At all times, when driving the tractor and equipment on the road or highway under 20 mph (32 kph) use flashing amber warning lights and a slow moving vehicle (SMV) identification emblem. Do not exceed 20 mph (32 kph). Reduce speed on rough roads and surfaces.

Plan your route to avoid heavy traffic.

Always install transport locks, pins or brackets before transporting.

Do not drink and drive.

Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc. Watch for traffic when operating near or crossing roadways.

Turn curves or go up or down hills only at a low speed and at a gradual steering angle. Make certain that a least 20% of the tractor's weight is on the front wheels to maintain safe steerage. Slow down on rough or uneven surface. Always check tractor manual for proper use on slopes.

Use extreme care and maintain minimum ground and when operating close to ditches or fences. Be careful when turning sharp corners.

Never allow riders on either tractor or tiller.

MAINTENANCE

Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.

Follow good shop practices.

Keep service area clean and dry

Be sure electrical outlets and tools are properly grounded

Use adequate light for the job at hand.

Make sure there is plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.

Before working on this machine, disengage the PTO, shut off the engine, set the brakes, and remove the ignition keys.

Be certain all moving parts on attachments have come to a complete stop before attempting to perform maintenance.

Never work under equipment unless it is blocked securely.

Always use personal protection devices such as eye, hand and hearing protectors, when performing any service or maintenance.

Frequently check tiller tines. They should be sharp, free of nicks and cracks and securely fastened.

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Periodically tighten all bolts, nuts, and screws and check that all cotter pins are properly installed to ensure unit is in safe condition.

When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

After servicing, be sure all tools, parts and service equipment are removed from tiller.

Do not allow debris, grease or oil to build up on any deck or platform.

When replacement parts are necessary for periodic maintenance and servicing, genuine factory replacement parts must be used to restore your equipment to original specifications.

The manufacturer will not be responsible for injuries or damages caused by use of unapproved parts and/or accessories.

A fire extinguisher and the first aid kit should be kept readily accessible while performing maintenance on this equipment.

STORAGE

Following operation, or when unhooking the tiller, stop the tractor, set the brakes, disengage the PTO, shut off the engine and remove the ignition keys.

Store the unit in an area away from human activity.

Do not park equipment where it can be exposed to direct contact to livestock for long periods of time. Damage and livestock injury could result.

Make sure all parked machines are on a hard, level surface and engage all safety devices.

EQUIPMENT SAFETY GUIDELINES

Safety of the operator and bystanders is one of the main concerns in designing and developing a tiller. However, every year accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions and insist those working with you, or for you, follow them.

In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.

Replace any safety sign that is not readable or missing. Location of such safety signs are indicated in this manual.

Never use alcoholic beverages or drugs that can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.

Under no circumstances should children under the age of 18 be allowed to work with this equipment. Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and how it works. Review the safety instructions with all users annually.

This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with farm machinery and trained in this equipment's operations. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.

Use a tractor equipped with a Roll Over Protective System and seat belts. (ROPS)

Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question- DON'T TRY IT.

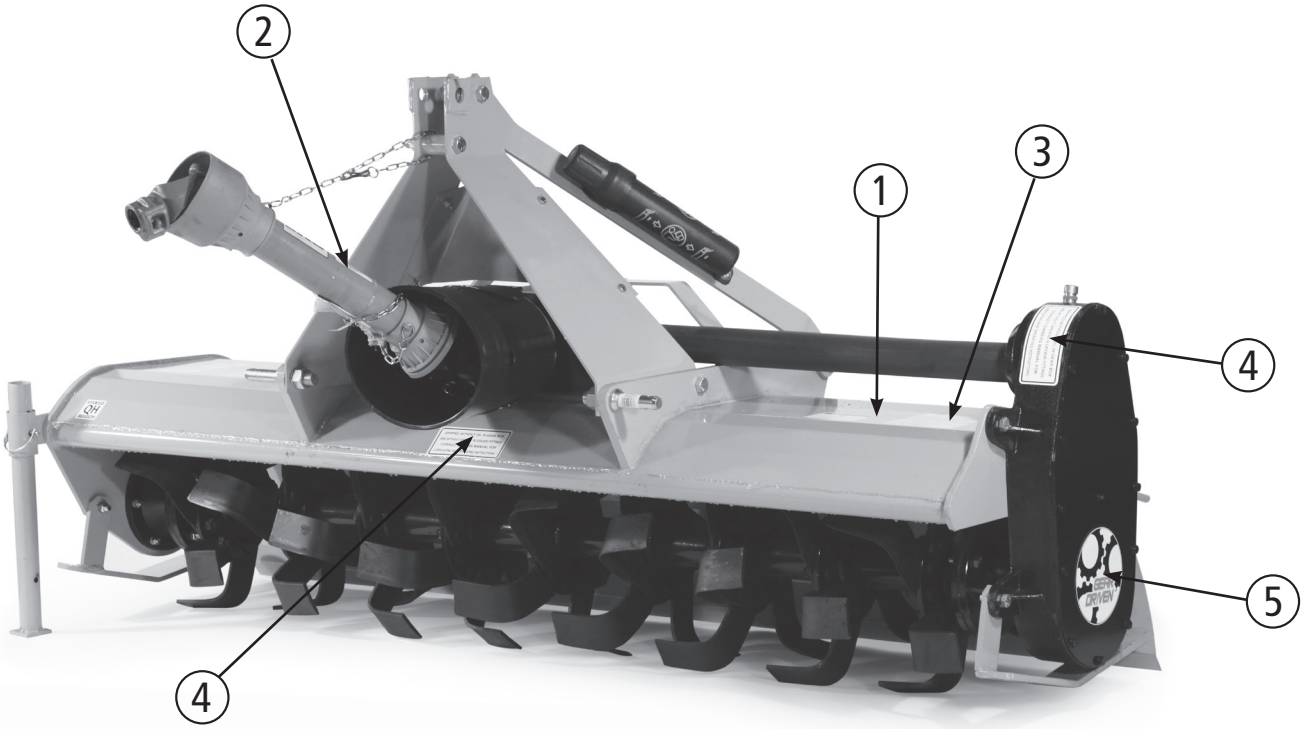
Do not modify the equipment in any way. Unauthorized modification could result in serious injury or death and may impair the function and life of the equipment.

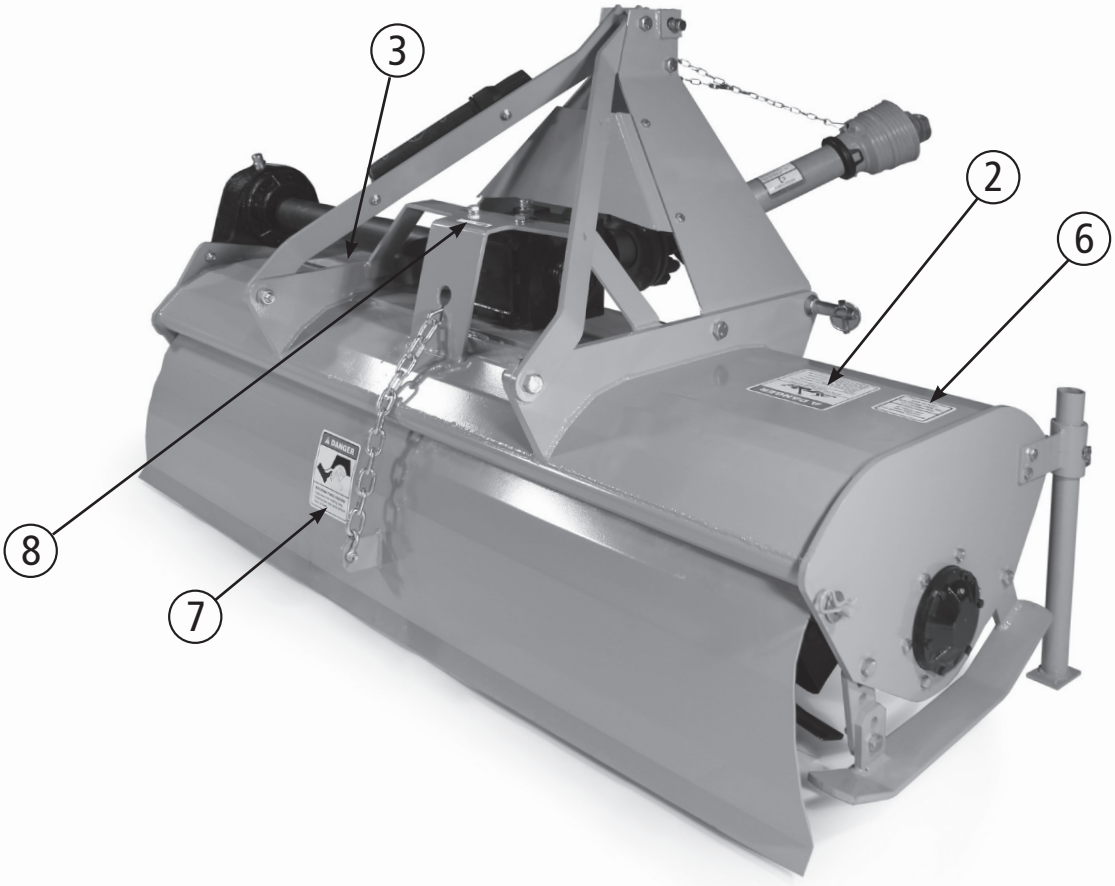
In addition to the design and the confirmation of this implement, including safety signs and safety equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to safety messages and operation instruction in each of the appropriate sections of the tractor and tiller manuals. Pay close attention to the safety signs affixed to the tractor and the tiller.

⚠ SAFETY AND INSTRUCTION DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

Replace Immediately if Damaged!





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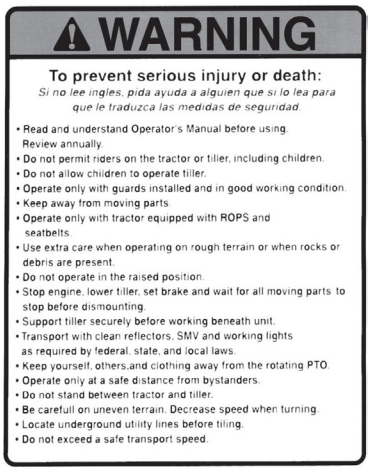

WARNING
To prevent serious injury or death:
Si no lee ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad.
• Read and understand Operator's Manual before using. Review annually.
• Do not permit riders on the tractor or tiller, including children.
• Do not allow children to operate tiller.
• Operate only with guards installed and in good working condition.
• Keep away from moving parts.
• Operate only with tractor equipped with ROPS and seatbelts.
• Use extra care when operating on rough terrain or when rocks or debris are present.
• Do not operate in the raised position.
• Stop engine, lower tiller, set brake and wait for all moving parts to stop before dismounting.
• Support tiller securely before working beneath unit.
• Transport with clean reflectors, SMV and working lights as required by federal, state, and local laws.
• Keep yourself, others,and clothing away from the rotating PTO.
• Operate only at a safe distance from bystanders.
• Do not stand between tractor and tiller.
• Be carefull on uneven terrain. Decrease speed when turning.
• Locate underground utility lines before tiling.
• Do not exceed a safe transport speed.

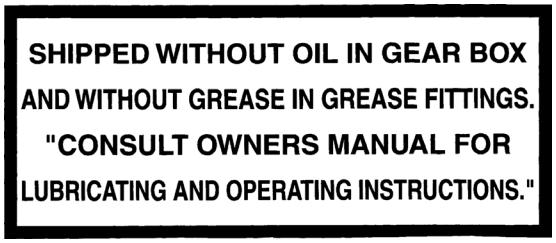
1 **WARNING INJURY**

DANGER
ROTATING DRIVELINE HAZARD
KEEP AWAY
To prevent serious injury or death from rotating driveline:
• Keep all guards in place when operating.
• Operate only at 540 RPM
• Keep hands, feet, clothing and hair away from moving parts.
• Do not operate without driveline securely attached at both ends.
• Do not operate without driveline shields that turn freely on driveline.

2 **ENTANGLEMENT**

WARNING
TO PREVENT SERIOUS INJURY OR DEATH
• Keep hands and body out of hitch area when attaching mower to tractor.
• Keep body clear of crush point between tractor and mower.

3 **CRUSH POINT**


SHIPPED WITHOUT OIL IN GEAR BOX
AND WITHOUT GREASE IN GREASE FITTINGS.
"CONSULT OWNERS MANUAL FOR
LUBRICATING AND OPERATING INSTRUCTIONS."

4 **LUBRICATION NOTICE**

5 **GEAR DRIVEN**

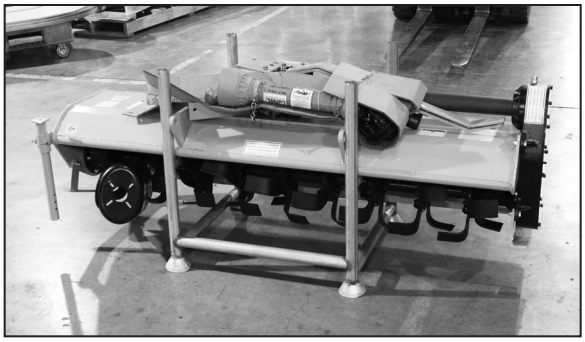
6 **MODEL #**

7 **ROTATING TINES**

8 **LIFT HERE**

ASSEMBLING

Tools Needed: Socket & wrench sizes are 9/16", 3/4", 15/16", and 1-1/4". Impact wrench preferred.



1. With rotary tiller still in rack, set on a level spot for assembly of tiller.

2. Insert a lift strap in gearbox mounting frame.

3. Remove PTO shaft.

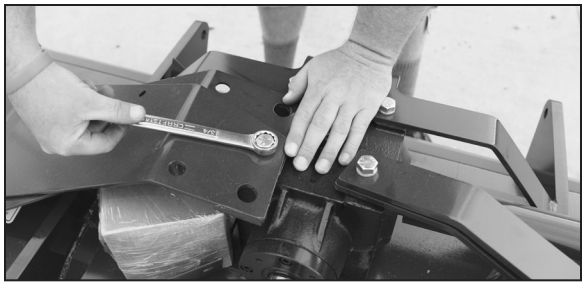
4. Slowly lift tiller from shipping rack.

5. Before setting on level ground, remove pin from kick stand and adjust so the tiller sits level for assembly.

6. Remove the tie straps from the skids on both sides of the tiller and the PTO shield from the front.

7. Place on level ground for assembly.

8. Remove lift strap.



9. Remove "A"-arm plates and rear braces with 3/4" wrench and discard bolts.

10. Remove boxed hardware, PTO shield, and two (2) bushings.

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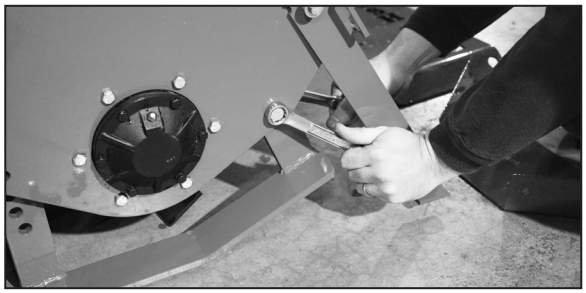
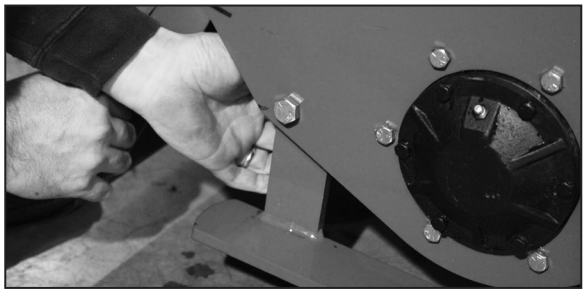


11. Loosen front skid plate bolt on both sides.



12. Insert 1/2" x 1-1/2" bolt and lock nut into back adjustment holes. Fully tighten.

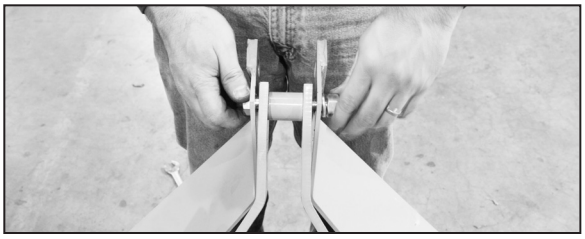
NOTE: Hand tighten all bolts until otherwise directed in these instructions.

13. Attach "A"-arm plate to the front of the tiller deck bracing using Category 1 pins and provided 5/8" x 2" hex bolt.

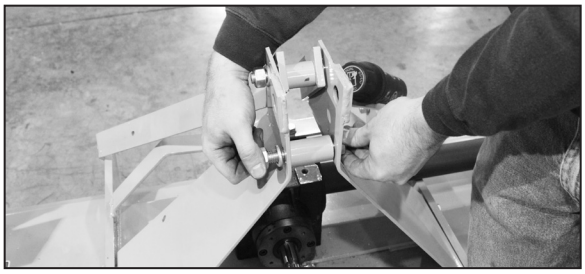
14. Repeat for opposite side.

15. Attach the rounded end of the brace to the outside of the rear tiller deck bracing using provided 5/8" x 2" hex bolt.

16. Repeat for opposite side.



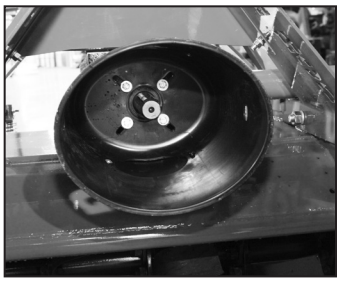
17. Attach the square end of the rear brace to the inside "A"-arm plates using 1-1/2" spacer and 5/8" x 4" hex bolt.



18. Assemble 5/8" x 4" hex bolt and 2-1/4" spacer.

19. Attach PTO shield to the "A"-arm plates using 1/4" x 3/4" hex bolt.

20. Fully tighten all bolts.



21. Install PTO guard using four (4) 1/4" x 3/4" bolts and washers. Finally, install PTO driveline.

22. Assembly of your rotary tiller is now complete. Please read next section of this manual for filling remaining unit with oil and lubricating instructions.

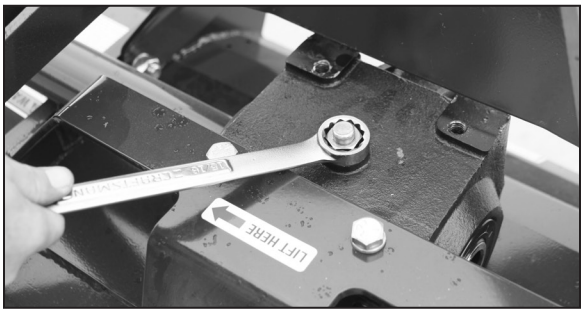
BEFORE PUTTING ROTARY TILLER INTO SERVICE

IMPORTANT: This tiller was shipped without oil in gearboxes and without grease in grease fittings. UNIT MUST BE SERVICED BEFORE USING.

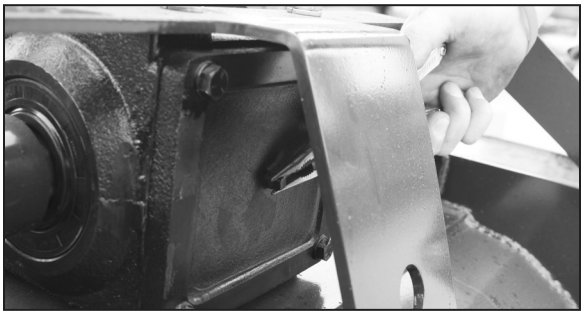
NOTE: Fill gearbox using gear oil (type GL5-85W 140 or Triple Zero Grease; which can be poured, and has "EP" i.e. "Extreme Pressure" additives).

NOTE: For all grease fittings use TYPE/grade II tube grease.

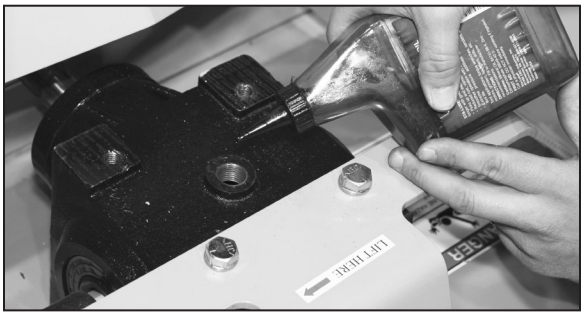
1. Place rotary tiller so that the deck is secure and level.



2. Using $^{7}/_{8}$" wrench, remove $^{1}/_{2}$" vented pipe plug located on front of gearbox above PTO shaft.



3. Remove check plug located at back of gearbox.



4. Fill gearbox in front using gear oil until oil begins to overflow from check plug hole in rear.

CAUTION

DO NOT overfill gearbox. This could cause damage to oil seals and can cause permanent damage to the gearbox. This issue will not be covered under warranty.

5. Replace and tighten the check plug.

6. Replace and tighten the $^{1}/_{2}$" vented pipe plug and clean away any excess oil.

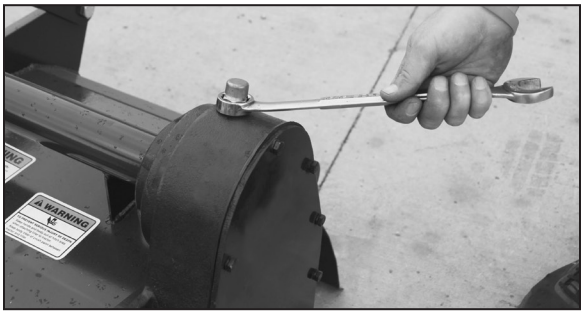


Figure C

Figure D

7. Using $^{7}/_{8}$" wrench, remove $^{1}/_{2}$" pipe plug located at top of side gearbox (Figure C) and the $^{1}/_{8}$" check plug located on side of the side gearbox (Figure D).

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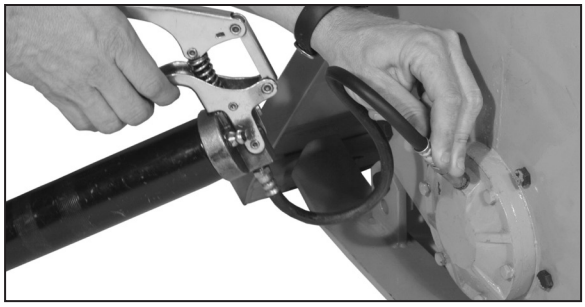
8. Fill side gearbox using gear oil until the oil begins to overflow from the check plug hole.

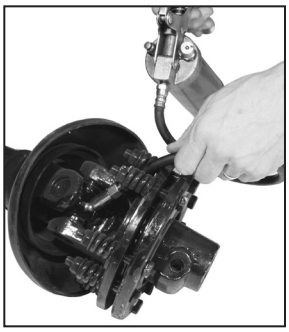
CAUTION

DO NOT overfill gearbox. This could cause damage to oil seals and can cause permanent damage to the gearbox. This issue will not be covered under warranty.

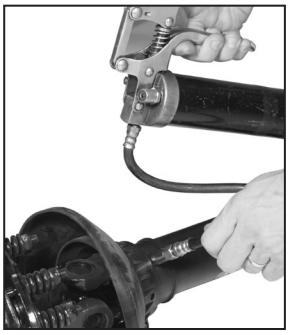
9. Replace and tighten the $^{1}/_{2}$" vented pipe plug and the $^{1}/_{8}$" check plug. Clean away any excess oil.



10. Grease the grease fitting on the "out-board hub".



11. Grease the two (2) grease fittings on the PTO universal joints.



12. Grease the two (2) grease fittings on the PTO safety shield.

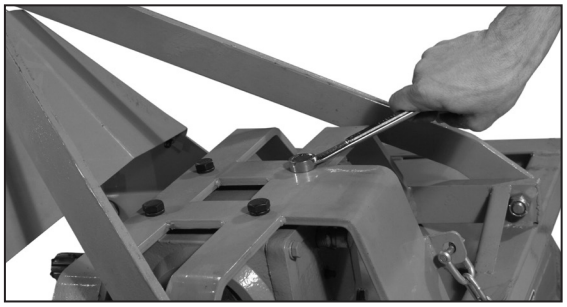
13. Separate the PTO shaft and grease the inner surface.

REVERSING TILLER/TINES DIRECTION

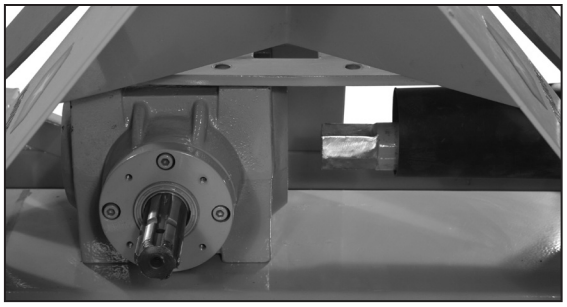
1. Unhook tiller from tractor.

2. Make sure tiller is securely blocked and leveled.

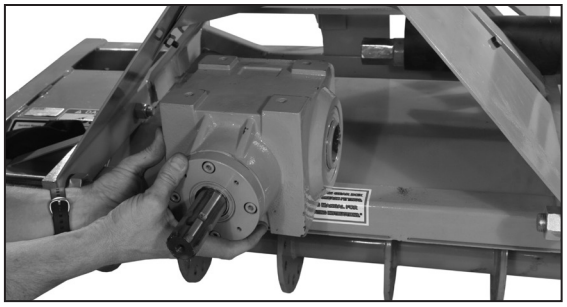
3. Remove PTO shaft from tiller.



4. Loosen and remove four (4) bolts on top of gearbox.

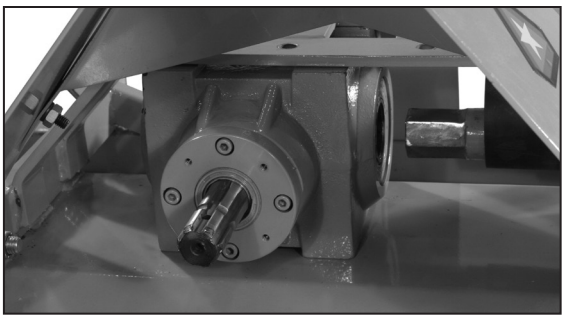


5. Slide gearbox to left approximately 3". Side shaft should drop out of gearbox on right hand side.



6. Slide gearbox forward and out.

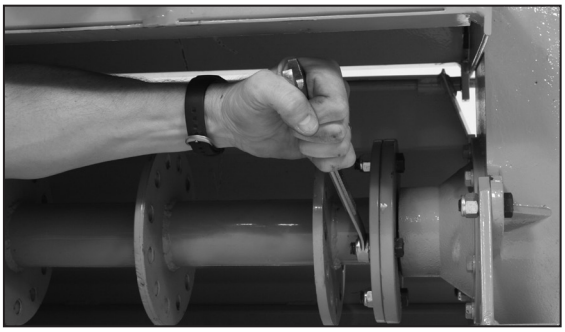
CAUTION **Gearbox is extremely heavy. Handle with care.**



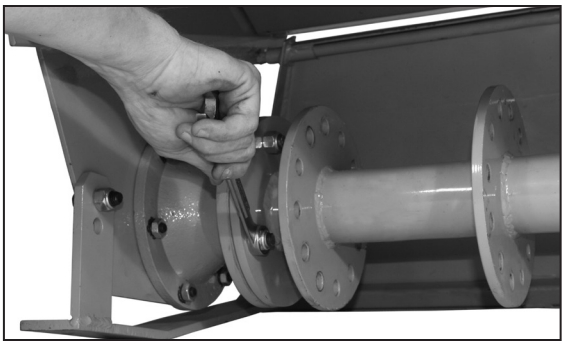
7. Flip gearbox over and re-insert into frame.

8. Slide shaft into side of gearbox until bolt holes in top of gearbox realign in frame.

9. Replace bolts and tighten.



10. To reverse tine direction, remove four (4) bolts in each end of tine carrier.



11. Carefully drop out tine set and turn 180° in opposite direction and reattach to each hub.

NOTE: Instructions made with tines removed for instructional clarity.

WARNING **Tine set is heavy and contains sharp edges. Handle carefully!**

ATTACHING TO TRACTOR

WARNING **Never stand between tractor and rotary tiller while backing up tractor to the hitch.**

1. Place tiller and tractor on level ground.
2. Back tractor into position by lining up lift arms and Category I pins on the tiller. Attach lift arms to Category I pins and secure with lynch pins.
3. Attach top link using Category I lift pin and lynch pin.
4. Attach PTO driveline and secure anti-rotation chains.
5. Once everything is securely attached, raise tiller off the ground and adjust the top link so the tiller sets level from front to back.
6. Determine if the PTO shaft needs to be shortened.

IMPORTANT: A driveline that is too long to fit between tractor and tiller will bottom out causing structural damage to the tractor and tiller.

Always check driveline collapsible length during initial setup, when connecting to a different tractor and when alternating between using a quick hitch and a standard 3-point hitch. More than one driveline may be required to fit all applications.

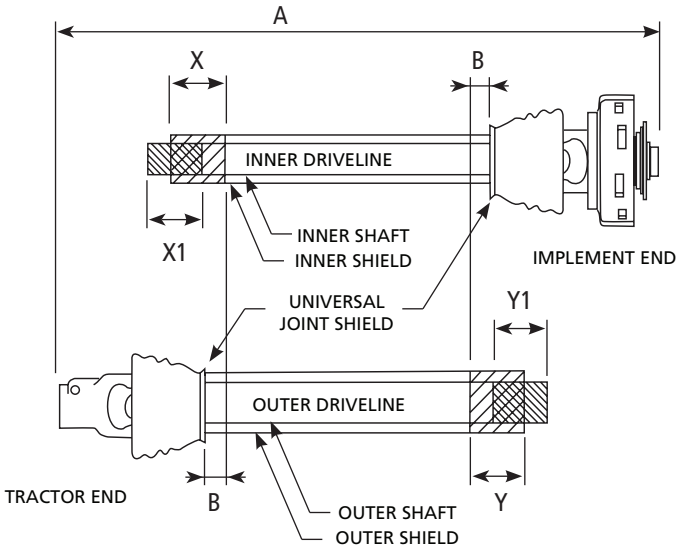
Refer to Figure 1

7. Make sure driveline is properly installed and level before checking driveline collapsible length.
8. With driveline level, measure 1" ("B" dimension) back from universal joint shield to end of outer driveline shield as shown in Figure 1. If measurement is less than 1", then shorten dirveline using instructions provided in section "Sizing The PTO Shaft".

SIZING THE PTO SHAFT

Refer to Figure 1

1. Un-hook driveline from tractor PTO shaft and pull outer and inner drivelines apart.
2. Reattach outer driveline to tractor PTO shaft. Pull on inner and outer drivelines to be sure universal joints are properly secured.
3. Hold inner and outer drivelines parallel to each other:
   a. Measure 1" ("B" dimension) back from outer driveline universal joint shield to make a mark at this location on the inner driveline shield.
   b. Measure 1" ("B" dimension) back from the inner driveline universal joint shield and make a mark at this location on the outer driveline shield.
4. Remove driveline from tractor and gearbox shafts.
5. Measure from end of inner shield to scribed mark ("X" dimension). Cut off inner shield at the mark. Cut same amount off the inner shaft ("X1" dimension).
6. Measure from end of outer shield to scribed mark ("Y" dimension). Cut off outer shield at the mark. Cut same amount off the outer shaft ("Y1" dimension).
7. Remove all burrs and cuttings.
8. Continue with "Check Driveline Maximum Length".



Driveline Shortening
Figure 1

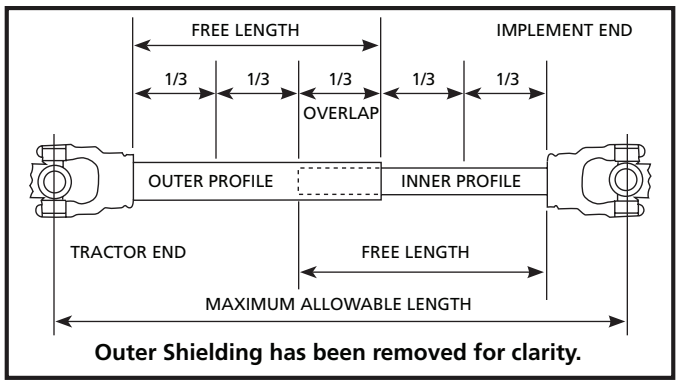
CHECK DRIVELINE MAXIMUM LENGTH

Refer to Figure 2

Make sure driveline collapsible length is acceptable. If needed, refer to "Attaching To Tractor".

The driveline maximum allowable length must, when fully extended, have a minimum overlap of the profile tubes by not less than 1/3 the free length with both inner and outer profile tubes being of equal length.

1. Apply multi-purpose grease to the inside of the outer shaft and reassemble the driveline.
2. Assemble the two driveline profiles together with just 1/3 overlapping of the profile tubes as shown below. Once assembled, measure and record the maximum allowable length for future reference.

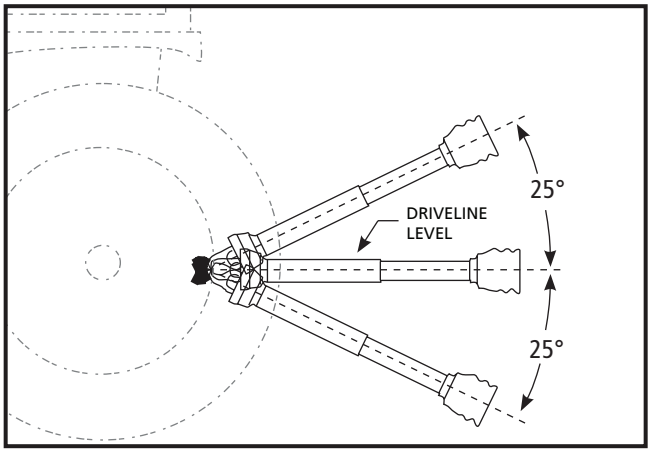


Driveline Maximum Extended Length
Figure 2

3. Attach inner driveline yoke to the tiller gearbox shaft. Attach outer driveline yoke to the tractor's PTO shaft.
4. Move yoke ends of driveline back and forth to insure they are secured to the tractor and tiller shafts. Reattach any end that is loose.

IMPORTANT: Small chains are supplied with the driveline. They must be attached to the inner and outer driveline shields and to the tiller and tractor to restrict shield rotation.

5. Hook driveline safety chain on the tractor end of driveline to tiller frame. Re-latch safety chain to the driveline shield.
6. Hook driveline safety chain on the Rotary Tiller end of driveline to the tiller frame. Re-latch safety chain to driveline shield.
7. Start tractor and raise Rotary Tiller just enough to remove support blocks.
8. Slowly engage tractor hydraulic 3-point control lever to lower the tiller while checking for sufficient drawbar clearance. Move drawbar ahead, aside or remove if required.
9. Raise and lower implement to find maximum extended driveline length. Check to make certain the driveline does not exceed maximum allowable length recorded in step 2.
10. If needed, set tractor 3-point lift height to stop driveline from exceeding maximum allowable length.
11. Continue with "Check Driveline Maximum Angle" below.



Check Driveline Maximum Angle
Figure 3

CHECK DRIVELINE MAXIMUM ANGLE

Refer to Figure 3

IMPORTANT: To avoid premature driveline breakdown, do not exceed an angle of 25° up or down with the driveline while driveline is rotating. If needed, set tractor 3-point lift lever to limit driveline angle at a maximum of 25° up.

1. Raise and lower implement to find maximum driveline angle. Check to make certain the driveline does not exceed 25° up or down.
2. If needed, set tractor 3-point lift height to keep driveline from exceeding 25° up.

OPERATING INSTRUCTIONS

1. Before each use perform the maintenance described in maintenance section on this page.

2. Read, understand, and follow the safety information on training, preparation, starting and stopping, operation, transportation, maintenance and storage at the beginning of this manual (pages 4 thru 7).

3. With the rotary tiller positioned on level ground, adjust the tractor lift arms so that when lifted, the rotor bar remains parallel to the ground.

4. With the rotary tiller attached to the tractor, raise and support the tiller with suitable blocks. Adjust the skids, located on the sides of the tiller. The adjustment bolts for both right and left sides should be positioned in the same adjustment hole. This allows the tiller to till the same depth on each side. Adjust the back plate, with regulating chain, until the desired mulching effect is found.

NOTE: Never attempt to adjust the rotary tiller while the tractor is running.

5. Raise the tiller and remove the blocks. Lower the tiller to the ground.

6. With the tractor at idle RPM and the tiller lifted off of the ground, engage PTO and slowly advance throttle to 540 PTO RPM.

NOTE: Rotary tiller is designed to run at 540 PTO RPM only.

7. Select a low gear for the tractor and begin to move forward. Tractor ground speed is to be controlled by gear selection only and not engine speed. As the tractor moves forward, slowly lower the tiller down. Allow the tiller tines to gradually engage the ground.

NOTE: Do not allow the tractor engine or rotary tiller to bog down or stall. This causes undue wear and tear on the tiller and tractor. If this continues to happen reduce ground speed and raise tilling depth of rotary tiller. Never attempt to remove objects from the rotor bar until the tractor has been shut down and the tiller tines have completely stopped.

WARNING

Never travel at a fast ground speed while using the tiller, this could damage it. Never attempt to turn the tractor or travel in reverse with the PTO engaged and the tiller in the ground. Always raise the tiller out of the ground when backing up or attempting to turn. Failure to do so may cause damage to the tiller.

8. After each use clean all debris from the tiller tines. Replace any missing or illegible safety decals. Inspect for any damaged or worn parts and replace before next use. Store rotary tiller in a dry environment.

MAINTENANCE

1. Periodically check and maintain proper gear oil level.

2. Every 8 hours, (1) grease "out-board hub", (2) PTO shaft universal joints, (3) PTO shaft safety shield and (4) PTO telescoping surface.

NOTE: Use only a grade Type II tube grease. Do not grease the slip clutch assembly.

3. Before each use check to make sure all safety shields are installed and working properly.

4. Check tiller tines for cracks and breaks before every use.

5. Periodically check all nuts and bolts to insure they are tight and secure.

6. Periodically loosen torque spring bolts and allow slip clutch to slip for approximately two (2) revolutions. Loosen the bolts until the springs lose contact with the flange yoke. This ensures that the slip clutch is not in a "locked" position.

7. Make sure that the clutch slips.

8. To retighten the slip clutch, tighten the torque spring bolts until the nut makes contact with the flange yoke and further tighten one and a half turns ($1\ ^1/_2$). This is a good starting point, further adjustments may need to be made based on soil conditions.

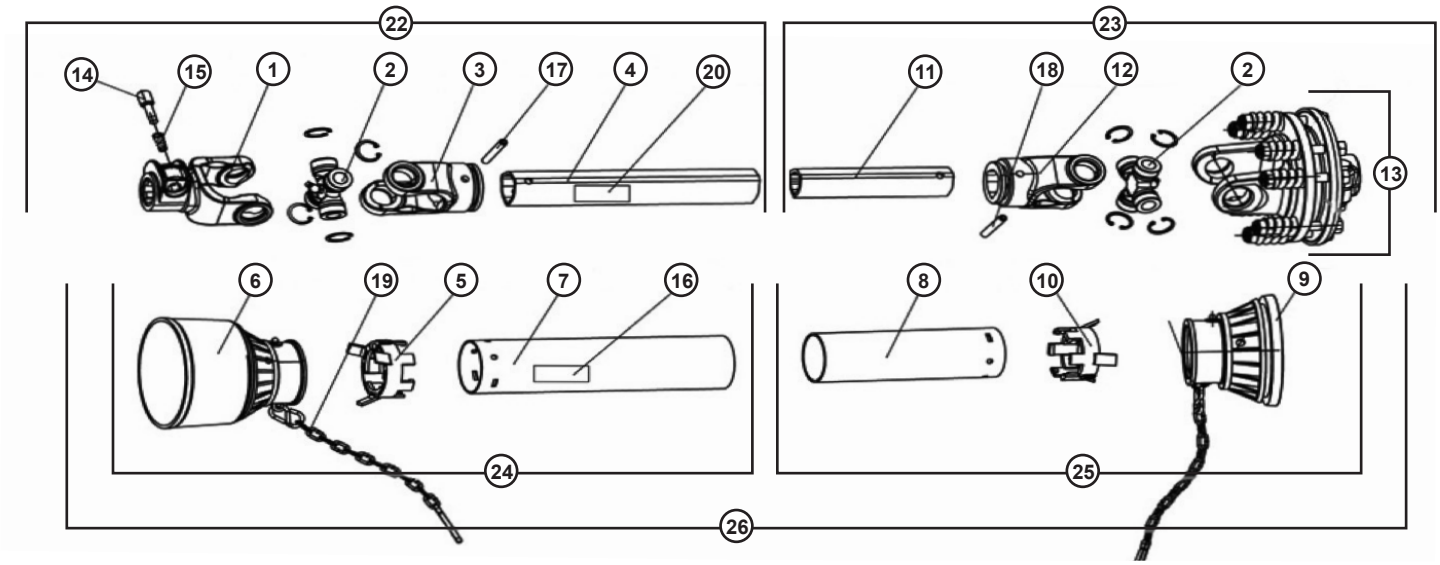
NOTE: Do not over or under tighten slip clutch assembly or damage may occur.

STORAGE

IMPORTANT: When the unit is going to be stored for an extended amount of time please perform the following steps to keep the oil seals from deteriorating.

- Spray shaft extensions with a suitable dry film or similar preservative
- Pack grease around seal to prevent drying and cracking
- Fill the gearbox with enough oil so that it covers the top of the input seal
- Remove the breather and replace with an airtight plug
- Remember to drain the oil back to the correct level before using again

PARTS



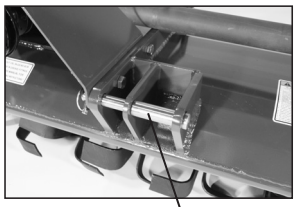
PTO Driveline Parts List

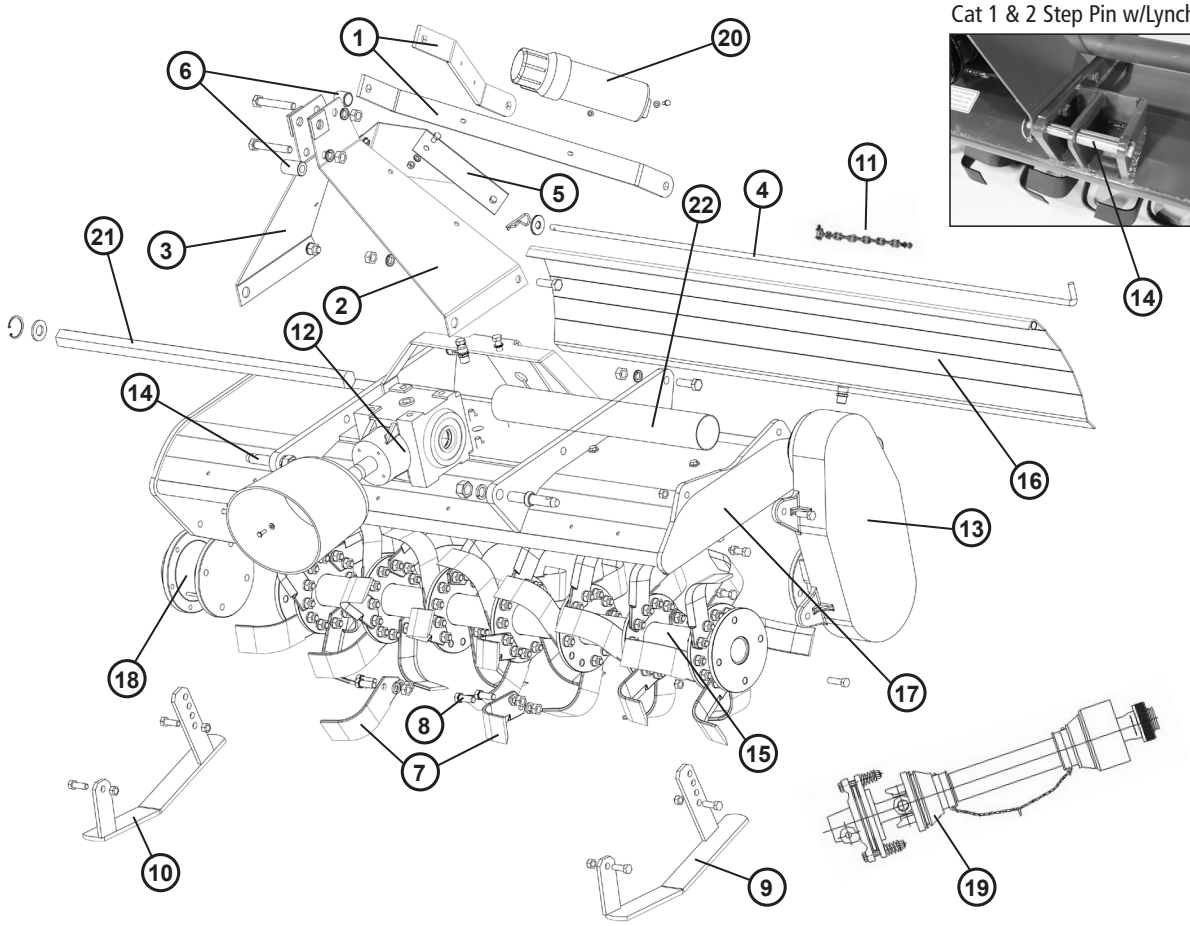
RT4, RTGR4, RT5, RTGR5, RT6, RTGR6, RT7, & RTGR7

Item Number	Part Number	Description
1	4.05.05B-986	Push Pin End Yoke
2	4.01-679	Cross Bearing
3	4.06-749	Outer Triangle Yoke
4	4.03	Outer Triangle Tube
5	4.08.3-007	Nylon Bearing
6	4.11.3-015	Plastic Cone
7	4.16-021	Outer Plastic Tube
8	4.17-022	Inner Plastic Tube
9	4.12.3.04.160-028	Plastic Cone
10	4.09.2-008	Inner Nylon Bearing
11	4.04	Inner Triangle Tube
12	4.07-754	Inner Triangle Yoke
13	4FF0-1500	4FF0 Friction Clutch

Item Number	Part Number	Description
14	00.02.01-44.5-201	Push Pin
15	00.10.01-973	Push Pin Spring
16	A-0	Outer Sticker
17	GB/T879.1-200008X60	Tensio n Pin 08X60
18	GB/T879.1-20008X55	Tension Pin 08X55
19	00.13.T1-1568	Chain
20	A-I	Inner Sticker
21	FF0.3	Friction Disc (2pk)(Not shown)
22	T4-500C-YP-4.05.05B-4FF0-1	Half Outer Shaft
23	T4-500C-YP-4.05.05B-4FF0-0	Half Inner Shaft
24	4-737-Y3-1	Half Outer Protection
25	4-737-Y3-0	Half Inner Protection
26	4-737-Y3	Complete Protection

Cat 1 & 2 Step Pin w/Lynch Pin





Rotary Tiller Parts List

RT4, RTGR4, RT5, RTGR5, RT6, RTGR6, RT7, & RTGR7

Item Number	Part Number	Description
1	7TBSWH	Backstrap w/Hardware (Yellow) (4', 5', 6', & 7')
1a	7TBSWHG	Backstrap w/Hardware (Gray) (4', 5', 6', & 7')
2	STTLHLAWH	Left Hand Lift Arm w/Hardware (Yellow) (4', 5', & 6')
2a	STTLHLAWHG	Left Hand Lift Arm w/Hardware (Gray) (4', 5', & 6')
2b	7TLHLAWH	Left Hand Lift Arm w/Hardware (Yellow) (7')
2c	7TLHLAWHG	Left Hand Lift Arm w/Hardware (Gray) (7')
3	STTRHLAWH	Right Hand Lift Arm w/Hardware (Yellow) (4', 5', & 6')
3a	STTRHLAWHG	Right Hand Lift Arm w/Hardware (Gray) (4', 5', & 6')
3b	7TRHLAWH	Right Hand Lift Arm w/Hardware (Yellow) (7')
3c	7TRHLAWHG	Right Hand Lift Arm w/Hardware (Gray) (7')
4	P-P1805	Round Steel w/Hardware (Yellow) (4')
4a	P-P1805-G	Round Steel w/Hardware (Gray) (4')
4b	P-P1905	Round Steel w/Hardware (Yellow) (5')
4c	P-P1905-G	Round Steel w/Hardware (Gray) (5')
4d	P-P2005	Round Steel w/Hardware (Yellow) (6')
4e	P-P2005-G	Round Steel w/Hardware (Gray) (6')
4f	7RSWH	Round Steel w/Hardware (Yellow) (7')
4g	7RSWHG	Round Steel w/Hardware (Gray) (7')

(continued on next page)

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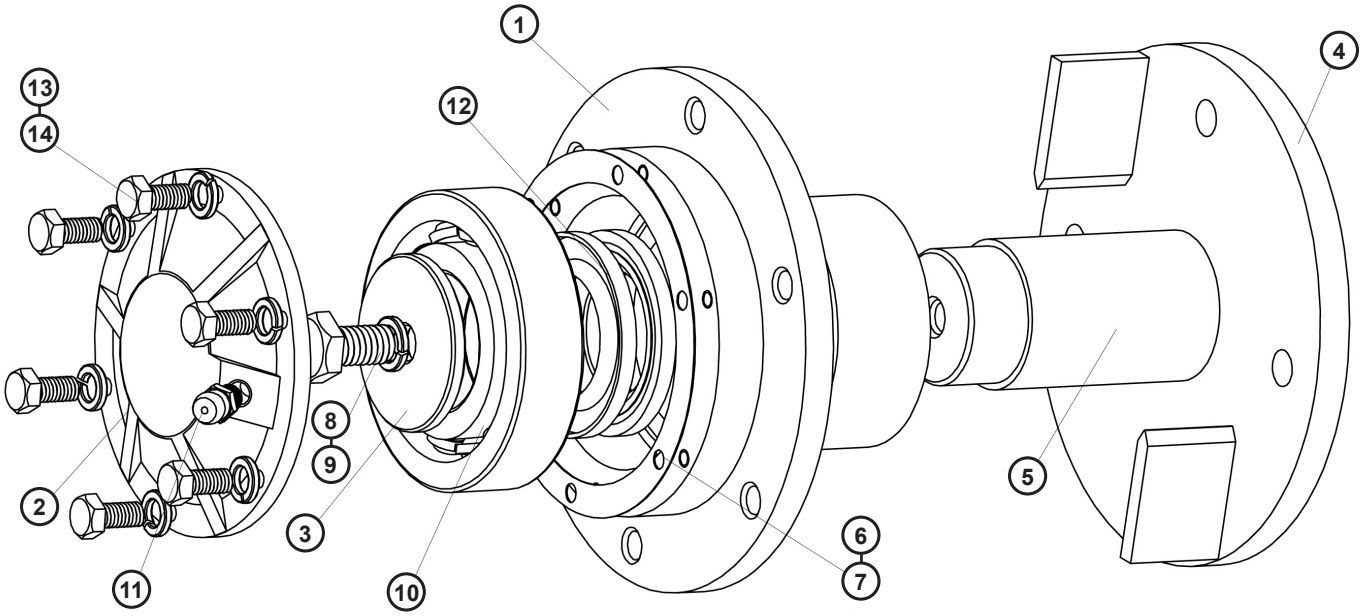
Item Number	Part Number	Description
5	7TFGPWH	Front Guard Plate w/Hardware (Yellow) (4', 5', 6', & 7')
5a	7TFGPWHG	Front Guard Plate w/Hardware (Gray) (4', 5', 6', & 7')
6	P-P1823	Top Link Spacer (Yellow)
6a	P-P1823-G	Top Link Spacer (Gray)
6b	P-P1833	Back Strap Spacer (Yellow)
6c	P-P1833-G	Back Strap Spacer (Gray)
7	P-P1811	Right Hand Tine Package w/Hardware
7a	P-P1812	Left hand Tine Package w/Hardware
8	P-P1813	Tine Bolt Package (72 pcs) (4')
8a	P-P1814	Tine Bolt Package (84 pcs) (5')
8b	P-P1815	Tine Bolt Package (108 pcs) (6')
8c	7TTBP	Tine Bolt Package (132 pcs) (7')
9	STTLHSSWH	Left Hand Skid Shoe w/Hardware (Yellow) (4', 5', & 6')
9a	STTLHSSWHG	Left Hand Skid Shoe w/Hardware (Gray) (4', 5', & 6')
9b	7TLHSSWH	Left Hand Skid Shoe w/Hardware (Yellow) (7')
9c	7TLHSSWHG	Left Hand Skid Shoe w/Hardware (Gray) (7')
10	STTRHSSWH	Right Hand Skid Shoe w/Hardware (Yellow) (4', 5', & 6')
10a	STTRHSSWHG	Right Hand Skid Shoe w/Hardware (Gray) (4', 5', & 6')
10b	7TRHSSWH	Right Hand Skid Shoe w/Hardware (Yellow) (7')
10c	7TRHSSWHG	Right Hand Skid Shoe w/Hardware (Gray) (7')
11	P-P1826	16 Link Chain (18" long)
11a	P-P1827	1/4" Chain Shackle
12	H-C0100	Tiller Top Gearbox Assembly w/Hardware
13	H-C0200	Tiller Side Gearbox Assembly w/Hardware
14	P-P1331	Tiller Lift Pins CAT 1
14a	7TC12SPWLP	7' Tiller Cat #1 & 2 Step Pin w/Lynch Pin
15	P-P1855	Rotor Assembly w/Hardware (4')
15a	P-P1955	Rotor Assembly w/Hardware (5')
15b	P-P2055	Rotor Assembly w/Hardware (6')
15c	7TRAWH	Rotor Assembly w/Hardware (7')

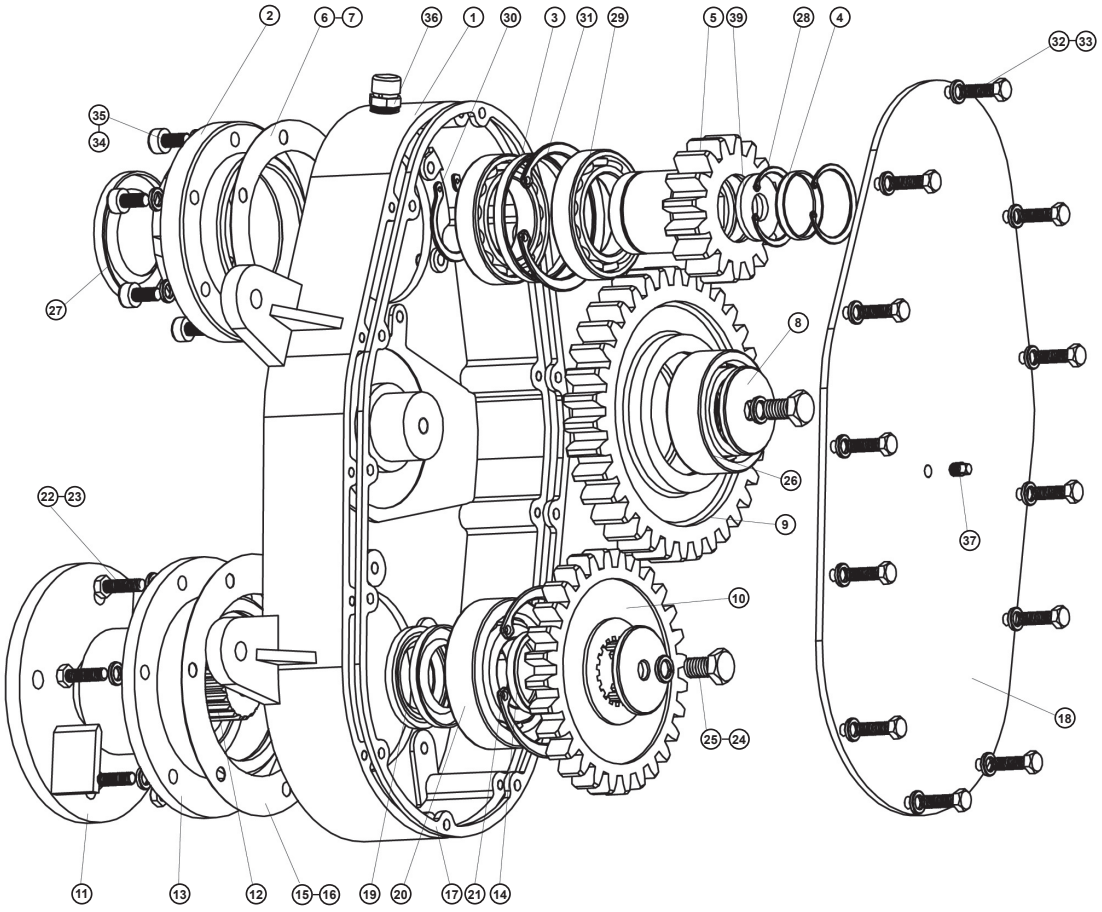
Item Number	Part Number	Description
16	4STTRGA	Rear Guards Assembly (Yellow) (4')
16a	4STTRGAG	Rear Guards Assembly (Gray) (4')
16b	5STTRGA	Rear Guards Assembly (Yellow) (5')
16c	5STTRGAG	Rear Guards Assembly (Gray) (5')
16d	6STTRGA	Rear Guards Assembly (Yellow) (6')
16e	6STTRGAG	Rear Guards Assembly (Gray) (6')
16f	7TRGA	Rear Guards Assembly (Yellow) (7')
16g	7TRGAG	Rear Guards Assembly (Gray) (7')
17	4STTFA	Frame Assembly (Yellow) (4')
17a	4STTFAG	Frame Assembly (Gray) (4')
17b	5STTFA	Frame Assembly (Yellow) (5')
17c	5STTFAG	Frame Assembly (Gray) (5')
17d	6STTFA	Frame Assembly (Yellow) (6')
17e	6STTFAG	Frame Assembly (Gray) (6')
17f	7TFA	Frame Assembly (Yellow) (7')
17g	7TFAG	Frame Assembly (Gray) (7')
18	H-C0300	Tiller Outboard Hub Assembly w/Hardware
19	4-30QDTL	Tiller 4# PTO Shaft w/Clutch Plates
20	P-P1870	Tiller Manual Holder w/Hardware
21	P-P1825	Hexagon Drive Shaft (4')
21a	P-P1903	Hexagon Drive Shaft (5')
21b	P-P2003	Hexagon Drive Shaft (6')
21c	7THS	Hexagon Drive Shaft (7')
22	P-P1824	Driveline Shaft Guard (4')
22a	P-P1902	Driveline Shaft Guard (5')
22b	P-P2002	Driveline Shaft Guard (6')
22c	TA5	Driveline Shaft Guard (7')
23	STTHP	Hardware Pack (4', 5', & 6') (Not Shown)
23a	7STHP	Hardware Pack (7') (Not Shown)
24	7TSWH	Tiller Stand w/Hardware Pack (Yellow) (4', 5', 6' & 7') (Not Shown)
24a	7TSWHG	Tiller Stand w/Hardware Pack (Gray) (4', 5', 6' & 7') (Not Shown)



Out-Board Hub Parts List

RT4, RTGR4, RT5, RTGR5, RT6, RTGR6, RT7, & RTGR7

Item Number	Part Number	Description
1	H-C0311	Hub Brg Saddle
2	H-C0312	Hub Cap
3	H-C0253	*416M* Ring
4	H-C0254	Flange
5	H-C0321	Hub Shaft
6,7	H-C0341	Hub Gasket
8	S-307	Screw
9	S-304	Hub Washer
10	S-127	Ball Bearing
11	S-506	Hub Nozzle
12	S-212	Seal
13	S-311	Screw
14	S-312	Hub Washer

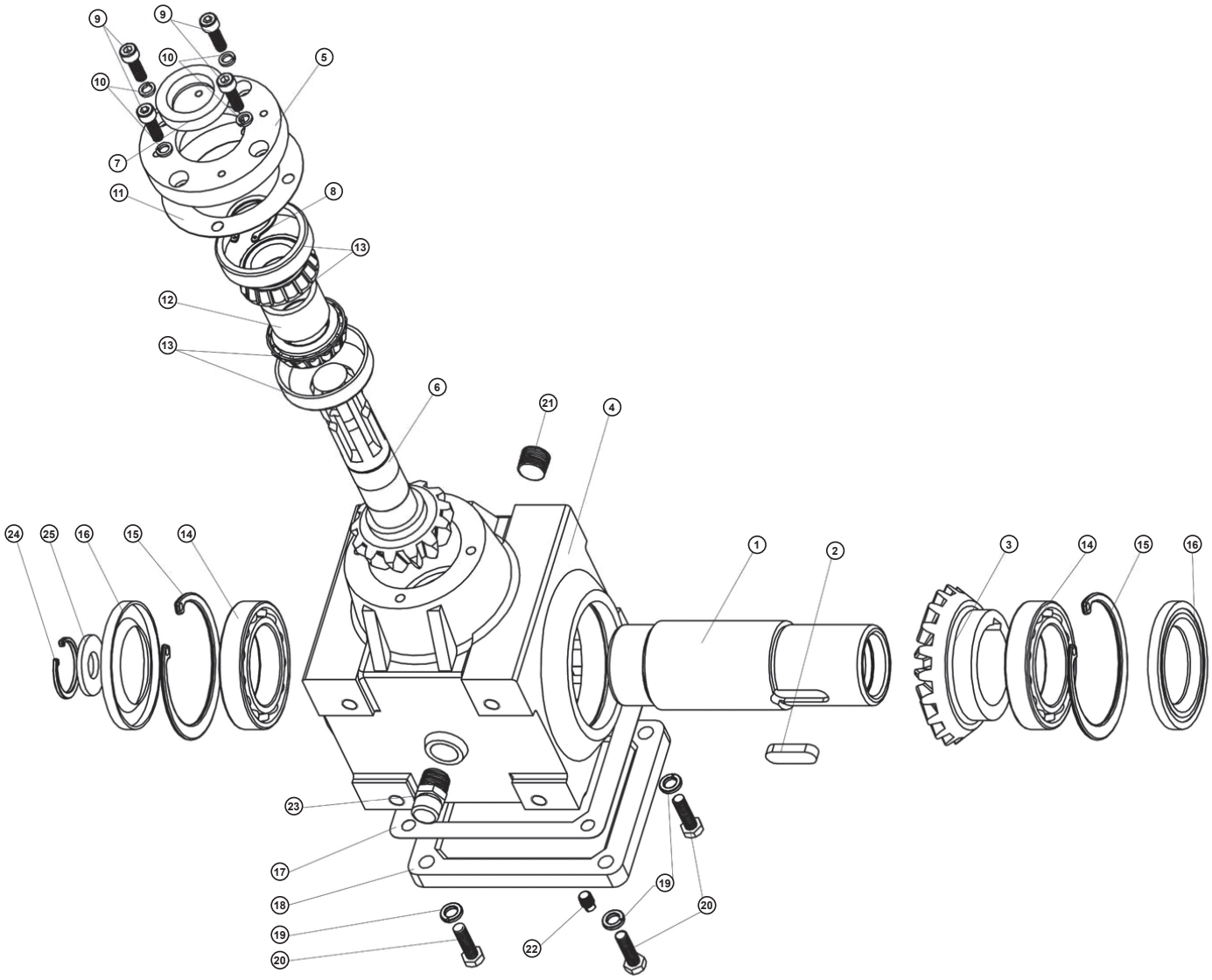


Side Gearbox Parts List

RT4, RTGR4, RT5, RTGR5, RT6, RTGR6, RT7, & RTGR7

Item Number	Part Number	Description
1	H-C0211	House
2	H-C0212	Input Brg Saddle
3	H-C0251	Spacer I
4	H-C0245	Sealed Cap
5	H-C0221	Gear Shaft-Input
6	H-C0241	0.5mm Gasket-Input
7	H-C0242	0.3mm Gasket-Input
8	H-C0253	Ring
9	H-C0222	Pinion
10	H-C0224	Gear-Output
11,12	H-C0254	Flange w/Output Shaft
13	H-C0213	Output Brg Saddle
14	H-C0252	Spacer II
15	H-C0243	0.5mm Gasket-Output
16	H-C0244	0.3mm Gasket Output
17	H-C0246	Seal
18	H-C0214	Cap
19	S-211	Seal-Output
20	S-125	Bearing

Item Number	Part Number	Description
21	S-410	Retaining Ring
22	S-301	Screw
23	S-302	Washer
24	S-307	Screw
25	S-304	Hub Washer
26	S-126	Ball Bearing
27	S-212	Seal
28	S-411	Retaining Ring
29	S-123	Bearing
30	S-412	Retaining Ring
31	S-406	Retaining Ring
32	S-308	Screw
33	S-309	Washer
34	S-310	Screw (Inner Hex.)
35	S-302	Washer
36	S-502	Plug Pressure Relief
37	S-503	Pipe Plug-Sq. Head
38	S-412	Retaining Ring
38	H-CO216	Flat Washer



Top Gearbox Parts List

RT4, RTGR4, RT5, RTGR5, RT6, RTGR6, RT7, & RTGR7

Item Number	Part Number	Description
1	H-C0122	Shaft-Output
2	S-122	Key
3	H-C0124	Gear-Output
4	H-C0111	Housing
5	H-C0112	Cap-Input
6	H-C0125	Cear Shaft-Input
7	S-201	Seal
8	S-403	Retaining Ring
9	S-305	Screw
10	S-306	Washer
11	H-C0141	Gasket
11a	H-C0142	Gasket
12	H-C0151	Spacer

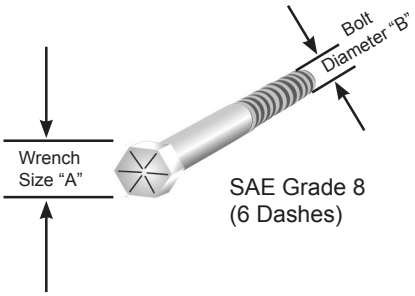
Item Number	Part Number	Description
13	S-123	Bearing
14	S-124	Bearing
15	S-406	Retaining Ring
16	S-209	Seal
17	H-C0143	Gasket (Rectangle)
18	H-C0113	Cap
19	S-302	Washer
20	S-301	Screw
21	S-504	Pipe Plug-Inner 6f
22	H-503	Pipe Plug-Sq. Head
23	H-502	Pipe Pressure Relief
24	S-407	Retaining Ring
25	1G150-45	Washer

TORQUE SPECIFICATIONS

AMERICAN
Bolt Head Markings

SAE Grade 2
(No Dashes)

SAE Grade 5
(3 Dashes)

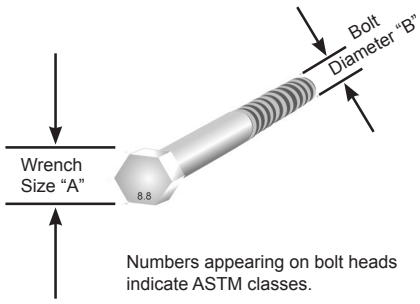


SAE Grade 8
(6 Dashes)

Proper torque for American fasteners used on manufactured implement.
Recommended Torque in Foot Pounds (Newton Meters).*

WRENCH SIZE(IN.)"A"	BOLT DIAMETER (IN.)"B" AND THREAD SIZE	SAE GRADE 2	SAE GRADE 5	SAE GRADE 8
7/16	1/4 -20 UNC	6 (7)	8 (11)	12 (16)
7/16	1/4 - 24 UNF	6 (8)	10 (13)	14 (18)
1/2	5/16 -18 UNC	11 (15)	17 (23)	25 (33)
1/2	5/16 - 24 UNF	13 (17)	19 (26)	27 (37)
9/16	3/8 - 16 UNC	20 (27)	31 (42)	44 (60)
9/16	3/8 -24 UNF	23 (31)	35 (47)	49 (66)
5/8	7/16 -14 UNC	32 (43)	49 (66)	70 (95)
5/8	7/16 - 20 UNF	36 (49)	55 (75)	78 (106)
3/4	1/2 - 13 UNC	49 (66)	76 (103)	106 (144)
3/4	1/2 - 20 UNF	55 (75)	85 (115)	120 (163)
7/8	9/16 -12 UNC	70 (95)	109 (148)	153 (207)
7/8	9/16 - 18 UNF	79 (107)	122 (165)	172 (233)
15/16	5/8 - 11 UNC	97 (131)	150 (203)	212 (287)
15/16	5/8 - 18 UNF	110 (149)	170 (230)	240 (325)
1-1/8	3/4 - 10 UNC	144(195)	266 (360)	376 (509)
1-1/8	3/4 - 16 UNF	192 (260)	297 (406)	420 (569)
1-5/16	7/8 - 9 UNC	166 (225)	430 (583)	606 (821)
1-5/16	7/8 - 14 UNF	184 (249)	474 (642)	668 (905)
1-1/2	1-8 UNC	250 (339)	644 (873)	909 (1232)
1-1/2	1 - 12 UNF	274 (371)	705 (955)	995 (1348)
1-1/2	1-14 UNF	280 (379)	721 (977)	1019 (1381)
1-11/16	1-1/8 - 7 UNC	354 (480)	795 (1077)	1288 (1745)
1-11/16	1-1/8 -12 UNF	397 (538)	890 (1206)	1444 (1957)
1-7/8	1-1/4 - 7 UNC	500 (678)	1120 (1518)	1817 (2462)
1-7/8	1-1/4 - 12 UNF	553 (749)	1241 (1682)	2013 (2728)
2-1/16	1-3/8 - 6 UNC	655 (887)	1470 (1992)	2382 (3228)
2-1/16	1-3/8 -12 UNF	746 (1011)	1672 (2266)	2712 (3675)
2-1/4 2-1/4	1-1/2 - 6 UNC 1-1/2 - 12 UNF	870 (1179) 979 (1327)	1950 (2642) 2194 (2973)	3161 (4283) 3557 (4820)

METRIC



Numbers appearing on bolt heads indicate ASTM classes.

*Use 75% of the specified torque value for plated fasteners. Use 85% of the specified torque values for lubricated fasteners.

Proper torque for metric fasteners used on manufacturer implement.
Recommended Torque in Foot Pounds (Newton Meters).*

WRENCH SIZE (mm) "A"	BOLT DIA. (mm) "B"	ASTM 4.6	ASTM 8.8	ASTM 9.8	ASTM 10.9
8	5	1.8 (2.4)		5.1 (6.9)	6.5 (8.8)
10	6	3 (4)		8.7 (12)	11.1 (15)
13	8	7.3 (10)		21.1 (29)	27 (37)
16	10	14.5 (20)		42 (57)	53 (72)
18	12	25 (34)	74 (100)	73 (99)	93 (126)
21	14	40 (54)	118 (160)	116 (157)	148 (201)
24	16	62 (84)	167 (226)	181 (245)	230 (312)
30	20	122 (165)	325 (440)		449 (608)
33	22		443 (600)		611 (828)
36	24	211 (286)	563 (763)		778 (1054)
31	27		821 (1112)		138(1542)
46	30	418 (566)	1119 (1516)		1547(2096)

NOTES